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10/780,191	02/17/2004	Hiroyuki Yamagishi	7217/71726	9923

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EXAMINER

BAKER, STEPHEN M

ART UNIT	PAPER NUMBER
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2112

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/780,191	Applicant(s) YAMAGISHI, HIROYUKI	
	Examiner Stephen M. Baker	Art Unit 2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2007.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-9 and 11 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 8, 9, and 11 are apparently poorly worded, vague and incorrect, and apparently should be amended as suggested below:

Claim 1: A decoding apparatus comprising:

Acquiring and equalizing means for acquiring encoded data by and performing a partial-response equalization on the encoded data, which is an information series encoded by a run length limited code having using a first finite state transition diagram, then converted and carried on an intersymbol interference path; ~~wherein the first finite state transition diagram accords with a run-length limited code~~; and

means for combined detecting and decoding the equalized acquired encoded data ~~by using based on~~ a trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and the intersymbol interference, the trellis satisfying both a run length limitation of the run length limited code and a partial-response characteristic of the partial-response equalization, ~~said encoded data having been generated by encoding an information series~~;

wherein the second finite state transition diagram includes states defined based on values of a non-return to zero coding of states in ~~the~~ a first finite state transition table.

Claim 8: A decoding method comprising the steps of:

acquiring encoded data by and performing a partial-response equalization on the encoded data, which is encoded by a run length limited code having using a first finite state transition diagram, then converted and carried on an intersymbol interference path; ~~wherein the first finite state transition diagram accords with a run-length limited code~~; and

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combined detecting and decoding the equalized encoded data acquired in ~~the step of acquiring by using~~ based on a trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and the intersymbol interference; the trellis satisfying both a run length limitation of the run length limited code and a partial-response characteristic of the partial-response equalization;

wherein the second finite state transition diagram includes states defined based on values of a non-return to zero coding of states in the a first finite state transition table.

Claim 9: A program storage medium storing a computer-readable program that describes the steps of:

acquiring and equalizing encoded data by performing a partial-response equalization on the encoded data, which is encoded by a run length limited code having using a first finite state transition diagram, converted and carried on an intersymbol interference path; ~~wherein the first finite state transition diagram accords with a run length limited code~~; and

combined detecting and decoding the equalized encoded data acquired in ~~the step of acquiring by using~~ based on a trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and the intersymbol interference, converted and carried on an intersymbol interference communication path; the trellis satisfying both a run length limitation of the run length limited code and a partial-response characteristic of the partial-response equalization;

wherein the second finite state transition diagram includes states defined based on values of a non-return to zero coding of states in the a first finite state transition table.

Claim 11: A recording/reproducing apparatus comprising:

encoding and converting means for encoding an information series by a run length limited code with a first finite state transition diagram in-by and performing a partial-response equalization conversion on the encoded data using a first finite state transition diagram; ~~wherein the first finite state transition diagram accords with a run length limited code~~; and

recording/reproducing means for recording and reproducing data encoded and converted by the encoding and converting means, in and from a recording medium having an intersymbol interference path;

equalizing means for partial-response equalizing the reproduced data; and

combined detecting and decoding means for detecting and decoding the equalized encoded data reproduced by the recording/reproducing means by using based on a trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and the intersymbol interference, the trellis satisfying both a run length limitation of the run length

limited code and a partial-response characteristic of the partial-response equalization;

wherein the second finite state transition diagram includes states defined based on values of a non-return to zero coding of states in the a first finite state transition table.

***Claim Rejections - 35 USC § 102***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1, 3-9 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,996,764 to Yamada (hereafter "Yamada").

Yamada discloses arrangements for reproducing data that has been encoded by a turbo code encoder followed by an RLL code encoder and then carried by a PR channel as a DC-free code. Yamada's combined PR-Channel APP decoder 43 is based on a combined RLL/PR code trellis, where the RLL code is a (1, 7) RLL code. Yamada shows an "acquiring means" in the form of a Reproduction Circuit 41. Yamada's combined PR-Channel APP decoder 43 is thus based on a "trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and intersymbol interference," where the "first finite state transition diagram" corresponds to the RLL code trellis, and the "intersymbol interference" corresponds to the trellis of the PR channel. As the PR channel transfer function is itself DC-free, the "1"s and "0"s of Yamada's DC-free code are presumably carried in the form of DC-symmetric values (i.e. "NRZ" values, such as +1, -1. Consequently, the RLL/PR trellis can be described as a "finite state transition diagram"

that "includes states defined based on values of a non-return to zero coding of states" which states are inherently capable, of course, of being carried in a "transition table."

5. Claims 1, 4, 6-9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by the published article "Performance Comparison of Selected DC-Free Codes for PR1-Equalized Magnetic Recording Channels" written by Zafer (hereafter "Zafer").

Zafer discloses arrangements for reproducing data that has been encoded by a turbo code encoder followed by an RLL (DC-Free) code encoder and carried by a PR1 channel. Zafer's data reproduction requires a PR-equalizer that provides an "acquiring means." Zafer's Viterbi decoder serves as a "means for decoding the acquired encoded data by using a trellis corresponding to a second finite state transition diagram that is a combination of the first finite state transition diagram and intersymbol interference," where the "first finite state transition diagram" corresponds to the RLL (DC-Free) code trellis, and the "intersymbol interference" corresponds to the trellis of the PR1 channel. As the PR channel transfer function is itself DC-free, the "1"s and "0"s of Zafer's DC-free code are presumably carried in the form of DC-symmetric values (i.e. "NRZ" values, such as +1, -1. Consequently, the RLL/PR trellis can be described as a "finite state transition diagram" that "includes states defined based on values of a non-return to zero coding of states."

***Claim Rejections - 35 USC § 103***

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada.

Yamada does not mention using a (2,7) RLL code in place of the (1, 7) RLL code. Official Notice is taken that a (2,7) RLL code is a well-known standard type of RLL code. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to substitute a (2,7) RLL code in place of Yamada's (1, 7) RLL code. Such a substitution would have been obvious because that a (2,7) RLL code is a well-known standard type of RLL code.

7. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zafer.

Zafer does not mention using a (1, 7) or (2,7) RLL code in place of the DC-Free modulation code. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to substitute a (1, 7) or (2,7) RLL code in place of Fang's (1, 7) DC-Free modulation code. Such a substitution would have been obvious because (1, 7) and (2,7) RLL codes are well-known standard types of modulation code.

### ***Response to Arguments***

8. Applicant's arguments filed 23 April 2007 have been fully considered but they are not persuasive.

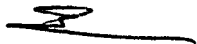
The rejections are drawn to the claims as can be best understood in view of the apparent shortcomings noted in the rejection made under 35 U.S.C. § 112, second paragraph.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. Baker whose telephone number is (571) 272-3814. The examiner can normally be reached on Monday-Friday (11:00 AM - 7:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques H. Louis-Jacques can be reached on (571) 272-6962. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Stephen M. Baker  
Primary Examiner  
Art Unit 2112

smb